TRANSLATING HISTORICAL DOCUMENTS OF LONGWOOD’S LOST INTERIORS INTO A VIRTUAL REALITY REPRESENTATION OF THE ROTUNDA

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OF THE ROTUNDA

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ABSTRACT

This study uses virtual reality to realize the never completed interior of Longwood, the largest octagonal home in the United States. This 30,000 sq. ft. home, designed by Samuel Sloan, is located in Natchez, MS. Construction halted due to the onset of the Civil War. Where once a lack of money prevented it from being completed, the structure in now preserved in its unfinished state under a deed for preservation. Many have speculated about what Longwood would have looked like, if finished. Using the historical narrative inquiry method, this investigation sought to discover to what extent an accurate virtual representation could be created of Longwood’s rotunda based on existing primary and secondary resources.
DEDICATION

This work is dedicated to my amazing family who has supported me through this journey, and without whom this would not have been possible. To my loving husband James, for his constant source of encouragement during the challenges of graduate school and life. This work is also dedicated to my parents, Jim and Debbie Hamilton, and my in-laws, Tim and Ruth Hathcock, who along with James have cared for our children James, Jr. (JJ) and Lilly while I furthered myself academically. Lastly, to JJ and Lilly, who have made it all worthwhile; I love you always and forever.
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CHAPTER I
INTRODUCTION

Background

Longwood, also nicknamed “Nutt’s Folly” because of its state of incompletion, is one of the few octagonal homes left in the United States. Construction of the 30,000 sq. ft. mansion in Natchez, MS halted when the Civil War broke out in 1861 (Whitwell, 1975). Never completed, much of Longwood stands today as it stood the day construction halted (see Figure 1 and Appendix A). The owner and Union sympathizer, Haller Nutt, lost his wealth during the Civil War. His land and crops were destroyed. Not being able to regain his financial footing, Nutt converted Longwood’s basement into living quarters for his family and lived there until his untimely death in 1864 (Whitwell, 1975).
Figure 1 Top image is a view from the rotunda into an adjacent room. Bottom image is a view from the rotunda looking up into the unfinished dome (photos by author)
Statement of Research Problem

In 1970, Longwood was deeded to the Pilgrimage Garden Club by the McAdams Foundation (Stratton Hall, 2018). A condition of this deed transfer was that the house remain in its preserved state (Whitwell, 1975). Since the house will never be physically finished, the goal of this study is to generate a virtual reality representation of Longwood’s rotunda that provides insight into the home’s intended interiors.

Research Question

The research question of this study is: To what extent can an accurate virtual representation of Longwood’s rotunda be created using primary and secondary sources of Longwood’s intended interior?

Research Design Summary

This qualitative study is a historical narrative inquiry, which is described as a “cyclical process involving inquiry, investigation, and interpretation” (Colby, 2008, p.65). The historical narrative inquiry method is derived from knowledge development, which includes posing meaningful questions, scrutinizing primary and secondary sources, and organizing historical documents into a narrative framework (Colby, 2008; Levstik & Barton, 2001; VanSledright, 2001; Yeager & Foster, 2001). There are six stages within the historical narrative inquiry model: contextual beginnings, in-depth questioning, secondary source analysis, primary document analysis, authorship, and philosophical reflection (Colby, 2008). Several primary and secondary resources have been used to provide insight into Nutt’s vision for Longwood. This information was translated into a virtual representation of what Longwood would have looked like, had it
been completed. AutoCAD, Revit, and SketchUp were used for the initial modeling, and renderings were converted into a virtual reality stereo panorama using the Enscape extension in SketchUp. The final outcome can be viewed using a mobile device with a portable virtual reality headset.

**Significance of Research**

This research study demonstrates how history can be preserved and visual gaps can be realized through virtual representation, thereby allowing historic architecture and interiors to be more fully portrayed and examined by future generations. The study’s outcome is a visual narration of Nutt’s vision for Longwood’s rotunda. The objective of this research is about compiling an inventory of information regarding the intended interiors. Longwood was not only chosen for this historical research study because of its historical significance, but also because of its state of preservation. Longwood, the largest octagonal-shaped home in the United States (Paradis, 2011), is topped with an onion-shaped Moorish dome, has a central gallery, and is designed in the Victorian Revival Italianate style. Historical research is important for both practitioners and academics in the field of interior architecture and design. This study will benefit practitioners, students, scholars, and architectural dilettantes and further build the body of knowledge of historic interiors in the Antebellum South.

**Research Objectives**

The following research objectives are noted in the study:

1. Gather information on Longwood, its original owners, its architect, and its building specifications.
2. Compare primary and secondary sources of Longwood’s original building specifications.

3. Determine information gaps in collected research data.

4. Develop a virtual representation of Longwood’s rotunda by translating primary and secondary data found within Longwood’s original specifications.

Assumptions

This study assumes that:

1. Documents were translated properly from their original primary source to those found in secondary sources.

2. The archived sources and information provided through personal communications were accurate.

Delimitations of the Study

The following delimitations are noted in the study:

1. Longwood was chosen as the building for this study due to its unique architecture, incomplete state, and ability to access the home.

2. The virtual representation is limited to Longwood’s view from the rotunda with a limited site line into one adjoining room on the principal floor.

3. The time period of the virtual representation is that of when the home was originally built.
4. The computer programs used to build the virtual representation are limited to those familiar to the researcher. These programs include AutoCAD, Revit, SketchUp, and Adobe InDesign.

**Limitations of the Study**

The following limitations are noted in the study:

1. Lost documents from past fires at the plantation could have provided further expansion of information.
2. Possible documents in family collections that are not part of the archived library and not accessible at the time of this study.
3. Unknown documents or materials that are not accessible to the public.
4. Areas of the rotunda home that were not accessible due to safety concerns during the site visit, therefore not able to compare field measurements with original floor plan.
5. Potential bias of researcher and prior knowledge of historic architecture, interiors, furniture, and materials that could influence the virtual representation.

**Definitions of Key Terminology**

**AutoCAD** – a computer-aided design and drafting software developed by Autodesk (Autodesk, 2019a).

**Deed for Preservation** – a legal document regarding ownership of a property, with stipulations on preserving the property in its current state (National Parks Service, 2010).
Foxing – an age-related deterioration of old paper, which causes spots, browning, stains, or specs (Roberts & Etherington, 1982).

Historical Empathy – the ability to enter the world of the past and demonstrate an in-depth understanding of its realities (Colby, 2008).

Historical Narrative Inquiry - method derived from knowledge development, which includes posing meaningful questions, scrutinizing primary and secondary sources, and organizing the historical documents into a narrative framework (Colby, 2008; Levstik & Barton, 2001; VanSledright, 2001; Yeager & Foster, 2001)

Historic Preservation – act or process of applying measures necessary to sustain an existing form, integrity, and materials of a historic building. (Weeks & Grimmer, 1995)

Historic Restoration – act or process of accurately depicting form, features, and character of a property as it was in a certain period, including removing features from other periods and reconstructing missing features. (Weeks & Grimmer, 1995)

Muntin- strips of wood holding panes of glass in a window (Calloway, Cromley, & Powers, 1996).

Revit – a building information modeling software for architects, interior designers, engineers, and contractors established by Autodesk (Autodesk, 2019b).

SketchUp – a three-dimensional computer modeling program used by architects, interior designers, engineers, as well as film and video game designers (Trimble, 2019).

Unity – a cross-platform game creation engine (Unity, 2019).

Virtual Reality - a realistic and immersive simulation of a three-dimensional environment that is created using interactive software and hardware. It is experienced or controlled by movement of the body (Virtual Reality, n.d.).
CHAPTER II

LITERATURE REVIEW

Introduction

Longwood is an architecturally significant house, not only due to its unique architectural style, but also its history. This literature review covers the following topics: the Nutt family who owned Longwood, architect Samuel Sloan who designed the home, Longwood’s design and planned furnishings, information on historic preservation and restoration, and virtual representation.

Longwood

Longwood is a 30,000 sq. ft. mansion designed in a romantic Victorian Revival style with Italianate and exotic Moorish features (see Figure 2). It has an onion-shaped dome and a twenty-four-foot-wide, eight-sided central rotunda recurrent on every floor. It was constructed of brick and accented with Moorish style wood trim with Italianate brackets. Construction halted when the Civil War broke out in 1861 (Whitwell, 1975). Over a hundred thousand dollars was invested in Longwood prior to construction stopping (Oliver, n.d.). The only finished level is the basement, which leaves 23 out of the 32 planned rooms incomplete (Greene, 2017). The family and their descendants lived in Longwood’s basement until 1968. The house is now owned by the Pilgrimage Garden Club. Today, the home’s interior remains incomplete from the principal floor and up.
Haller and Julia Nutt, Owners

Haller Nutt purchased the original 84.32 acres of land on which Longwood stands for his wife, Julia Nutt on September 18, 1850 (McAdams, 1972). By 1858, Nutt and his slaves had built the servant’s house needed for Longwood. After viewing the octagonal home in Samuel Sloan’s book, *The Model Architect* (1853) (see Figure 3), Nutt hired Sloan in 1859 to design his own octagonal mansion (Paradis, 2011). According to Lancaster (1946), Nutt’s impulse to build a home in this style was due to his travels to Egypt where he investigated methods for cotton growing.
In fall of 1863, the Union forces destroyed Nutt’s cotton plantations in Louisiana. Total losses were estimated at $1,020,540 (Whitwell, 1975; Paradis, 2011). The plantation crops, most of the land, and farm machinery were either burned or confiscated, leaving the family penniless. Due to losing their wealth, Haller and Julia Nutt were never able to restart the construction of Longwood. Haller Nutt passed away from pneumonia on June 15, 1864, at the age of forty-eight (Whitwell, 1975). It wasn’t until later that Nutt’s heirs were able to recover partial compensation, totaling $188,000, for their losses since the Nutts were strong supporters of the Union (Whitwell, 1975; Paradis, 2011). In Julia Nutt’s original deposition, she noted all assets lost in the war,
totaling over 3 million dollars, but did not assign a value to her last line item, the life of Haller Nutt. In 1891, Julia Nutt obtained three estimates for completing Longwood, but did not pursue completion (Whitwell, 1975; McAdams, 1972). Julia Nutt lived at Longwood until she passed away in 1897 (Whitwell, 1975). Longwood was passed down through the Nutt family until the McAdams purchased and then deeded the home in 1970 to the current owners, the Pilgrimage Garden Club (Stanton Hall, 2018).

**Samuel Sloan, Architect**

Samuel Sloan was an architect from Philadelphia, PA. He advanced the idea of the octagon shaped house from Orson Fowler, author of *A Home for All* in 1848. In his book, Fowler describes the octagon shaped house as less expensive to build and maintain. The octagon shape encompasses more floor space per linear foot than a typical square or rectangular shaped home. Fowler explained how the octagon shape would enhance natural lighting, improve sunlight, and increase ventilation throughout the whole house. Fowler was also one of the first designers to include hot and cold running water, dumbwaiters, speaking tubes, and indoor flushing toilets in homes (Paradis, 2011). Sloan went on to design his version of an octagon home, which he described in his book, *The Model Architect* (1853), as design forty-nine, “An Oriental Villa” (see Figure 4). This is the same publication that motivated Haller Nutt to hire Sloan as the architect for Longwood (Crocker, 1977). In 1861, Sloan published Longwood’s elevation and floor plans in *Homestead Architecture* (1867) as Design I (Lancaster, 1946).
Longwood’s Design

Longwood’s design included modifications to Sloan’s Oriental Villa requested by the Nutt Family. Several modifications were noted in letters between Haller Nutt and architect Samuel Sloan (Whitwell, 1975; McAdams, 1972). The original letters are currently housed in the Huntington Library archives in San Marino, CA. Transcribed versions of the letters are in McAdams’s book, *The Building of Longwood* (1972). The designs for the basement and principal floors of Longwood were based on the first story of Sloan’s Oriental Villa, and the second floor of Longwood was based on the second story in Sloan’s Oriental Villa. In addition, an attic area was added to Longwood’s plan. Modifications included, additional floors, additional rooms, and
modified room sizes. Longwood’s features were to include: 26 fireplaces, 24 built-in closets, four large enclosed dressing rooms, four spacious wine closets, and 115 doors. After construction halted, Nutt used his own slaves to finish the eight-room basement. The interior walls were plastered, and the specified slate floor was changed to cypress. Of the features listed above, only eight fireplaces were installed, only four built-in closets, none of the planned dressing rooms or wine closets, and only thirty doors (Paradis, 2011; Whitwell, 1975).

In addition to rooms that were not complete, the finishes for the interior and exterior were also never completed. Bare brick stands as the base for what should have been plastering and frescoing on the interior walls and ceilings and rough-casting on the exterior walls with the surface tinted to represent stone (McAdams, 1972). All exterior woodwork was to receive three coats of white lead paint and linseed oil, and three coats of the best varnish on the walnut doors, interior hand-rails, newel posts, and balusters. Finish specifications are noted in the letters between Haller Nutt and Samuel Sloan, as well as McAdam’s book, *The Building of Longwood* (1972).

**Longwood’s Furnishings**

In Haller Nutt’s documents, held by the David M. Rubenstein Rare Books and Manuscript Library at Duke University (Nutt, 1846-1911), receipts indicate Nutt purchased the furniture for Longwood from George J. Henkel’s cabinet warerooms in Philadelphia. The receipts, reading “Please keep this until settlement,” indicated the furniture selected for most of Longwood’s rooms. Figure 5 shows the original receipt of furniture purchased for the reception room and a few bedchambers. The breakdown of these receipts can also be found in McAdam’s book, *The Building of Longwood* (1972). According to Fitzgerald (1982), George Henkel often
benefited from his relationship with Samuel Sloan, who were both from Philadelphia, PA. Sloan’s book *Homestead Architecture* (1867) featured sections of Henkel’s furniture. Henkel also published catalogs and papers on furniture for his customers.

Although, many of the rooms were noted in the furniture invoices from George Henkel, there are several other indicators of Longwood’s furnishings. Existing furnishings located at Longwood on the basement floor are archived on-site in the gift shop as well as in an online archive shared by Mimi Miller (Winterthur, n.d.). There was another collaboration between Samuel Sloan and George Henkel, the Asa Packer Mansion located in Jim Thorpe, Pennsylvania and built in 1861. Sloan designed the mansion, while Henkel provided the interior furnishings (M. Miller, personal communication, July 11, 2018).

![Figure 5](image-url) Furniture purchased for three rooms at Longwood from George J. Henkel’s cabinet warerooms (Nutt, 1846-1911)
Historic Preservation versus Restoration at Longwood

In 1966, thanks to President Lyndon B. Johnson, Congress passed the National Historic Preservation Act. This act created a clearly defined process and treatment for historic preservation in the United States. Historic structures are often documented to the Secretary of Interior’s Standards (National Parks Service, 2019). These standards define historic preservation “as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction” (Weeks & Grimmer, 1995, pg. 2). Restoration, in contrast, is defined by the National Historic Preservation Act, as the act or process to accurately depict form, features, and character of a property as it appeared in a particular period (Preservation, rehabilitation, restoration, and reconstruction: Different treatments for historic properties, 2019). Given the definitions of historic preservation and restoration, neither allowed for completion of Longwood. Instead, Longwood is maintained as it stands… incomplete.

Longwood, itself, is a unique case of historic preservation, since it was never finished, and has been preserved in a unique state. However, this means the full vision for Longwood will never be realized. After the Pilgrimage Garden Club took ownership of Longwood, it became a National Historic Landmark on February 14, 1971 (McAdams, 2972; Whitwell, 1975). A bronze plaque given by the National Parks Service commemorating the event is now attached to the front of the house (see Figure 6).
Although Longwood is primarily a preservation case, some restoration was completed to seal the house from the elements and restore items to its original state when construction stopped. The Pilgrimage Garden Club then appointed a committee to oversee Longwood’s restoration. An agreement for restoration efforts of Longwood was directed by Dix Fowler in November of 1973, using Sloan’s original specifications (Whitwell, 1975). Restoration work included the following: rotten gutters were replaced, architectural detail was copied and replaced, boarded windows were restored, clerestory windows were fixed and are now functional, and
water seepage was fixed with modern materials (Whitwell, 1975). In Longwood’s deed, the Pilgrimage Garden Club was asked to preserve the house in the state it was in when construction halted (Whitwell, 1975). Consequently, with the preservation restriction, Nutt’s dream and Sloan’s plan will never be finished.

Virtual Representation of Historic Sites

Research shows virtual reality is being used at historic sites to enhance the visitor experience (Chung, Han, & Joun, 2015). Virtual reality is defined as a realistic and immersive simulation of a three-dimensional environment that is created using computer software and interactive hardware. It is experienced or controlled by movement of the body (Virtual Reality, n.d.). With virtual reality, the user can be physically present in any space by using a headset to enter the virtual world. The user can move around the space and view it from multiple perspectives (Sweeney, Newbill, Ogle, & Terry, 2018).

In a study by Sweeney, Newbill, Ogle, and Terry (2018), virtual reality was used as a tool to evoke historical empathy. Historical empathy expresses the importance of respecting predecessors’ thoughts and feelings in order to understand humanity’s shared story (Lee & Shemilt, 2011; Sweeney et al, 2018). Historical empathy attempts to infer meaning in historical thought and actions based on evidence (Brooks, 2009; Sweeney et al, 2018). Building empathy builds understanding of social and cultural context, transferring to other times in history and places. Preserving cultural history can serve as a basis for heritage tourism. Heritage visitors on average spend more, stay longer, and shop more than other forms of tourism, having an economic significance on a local economy (Phillips & Stein, 2013; Chhabra, 2010; Rypkema & Wiehagen, 1998). Scholars also found that empathy can be supported in the classroom, helping
students avoid assumptions that might impede accurate understanding, and finds deeper meaning in the content, while developing deeper critical observation skills (Sweeney et al, 2018). Restoring sites digitally can open opportunities for creating long lasting, immersive, and engaging virtual reality experiences (Sweeney et al, 2018; Remondino et al., 2009). Historically responsible virtual environments offer a way to preserve and restore places and at times, offer an anchor for learners to explore experiences and perspectives by fitting their own story with history’s shared one (Sweeney et al, 2018).

**Conclusion**

Longwood’s designation as the largest octagonal home in the United States and its incomplete state due to the Civil War are what give Longwood just part of its architectural and historical significance. After construction stopped and the Nutts lost their fortunes, Longwood was unable to be completed. Longwood is to be preserved in its current state, as a living testimony of the home’s past. Fortunately, virtual reality is a tourism learning tool, capable of evoking historical empathy, and has the potential to be used to allow people to experience the completed interiors of Longwood, without disturbing its preserved state. The next chapter reveals the research methods used in this study.
CHAPTER III
RESEARCH METHODS

Introduction

This qualitative historical narrative inquiry was designed to determine to what extent a virtual representation of Longwood’s rotunda could be designed using primary and secondary sources. The information presented in this chapter includes the research sample, qualitative research design, methods for data collection and analysis, ethical considerations, trustworthiness, and limitations of the research study.

Research Sample

Research for this study was not site specific, as relevant sources were found throughout the United States. Consequently, documents were retrieved from the internet, archives located during field research, secondary source books, and collections maintained by the local historical foundation in Natchez. Library archives were pulled from the David M. Rubenstein Rare Book and Manuscript Library at Duke University and The Huntington Library, Art Collections, and Botanical Gardens. Archival files and courthouse documents were garnered from the Mississippi Department of Archives and History. Secondary sources included books, either written specifically about Longwood or that included Longwood. Books written specifically about Longwood included, *The Building of Longwood* (McAdams, 1972), *The Heritage of Longwood* (Whitwell, 1975), and *The Legend of Longwood* (Hendrix, 1972). Sources on the current
furniture found in the basement of Longwood and data for the planned furniture by George Henkel were also provided by Mimi Miller from the Historic Natchez Foundation.

The focus of the historical inquiry is site specific, in its concentration on Longwood in Natchez, MS. The information obtained is contextual in nature; the people, place, and things of Longwood. For this research study, the people were those with knowledge as to how Longwood would have looked had it been completed; this includes the Nutt Family, Samuel Sloan, Longwood’s architect, and George J. Henkel, furniture dealer. This also included personal interviews with Ron and Mimi Miller, both former executive directors of the Historic Natchez Foundation, as well as James Wade, Longwood’s curator. Contextual items such as material and furniture orders, letters between Nutt and Sloan, and receipts were also assessed for information necessary for the completion of the virtual representation.

**Research Design**

This historical narrative inquiry study used the six stages within the historical narrative inquiry model: contextual beginnings, in-depth questioning, secondary source analysis, primary document analysis, authorship, and philosophical reflection (Colby, 2008). First, the contextual beginnings stage consisted of gathering knowledge of the Nutt family, Samuel Sloan, Longwood, and historical events. This established a foundation in procedural knowledge and historic narrative analysis. Additional books were gathered that contained sections and chapters pertaining to Longwood for additional information that would assist in this study.

Second, the in-depth questioning in the historical narrative allowed the researcher to pose questions, examine people and events, and compare evidence (Colby, 2008; Husbands, 1996). Questions arose as to the information that was needed to complete the virtual representation, as
well as on the Nutt family, and architect, Samuel Sloan. There were also questions of the events that had taken place prior to construction, during construction, and after construction halted as to how Longwood came to be in its current state.

Third, the analysis of secondary sources improved comprehension, built a knowledge base, and facilitated inquiry. Pertinent data for further research was pulled from each of the Longwood books, as well as the Longwood sections from additional books. These were used in order to obtain the primary source locations for the data. Primary sources were then located for analysis.

Fourth, the analysis of primary sources was conducted to discover data needed to complete the virtual representation and verify secondary sources, comparing multiple documents, as well as checking and cross-checking interpretations. After identifying source locations from secondary sources, primary sources were located in various archives throughout the United States. Field research was also conducted at Longwood through measurements, interviews, and photography.

Fifth, the authorship phase of historical narrative inquiry, the researcher compared the research findings to secondary sources and the narrative. These added to the existing narrative and emphasized any discrepancies. In this phase, the data was combined in order to create the virtual representation. Authorship was created through a virtual narrative for viewing Longwood’s lost rotunda.

The final stage of historical narrative inquiry is the philosophical reflection, including reformulating any notions of the past through the virtual rendering, discussing findings, and planning for future inquiries. The final stage was accomplished with this written thesis by
reformulating notions from the past through the literature review in Chapter II, discussing findings in Chapter IV, and notating areas for future research in Chapter V.

**Methods of Data Collection**

Data was collected from December 2017 through December 2018. Data collection for this research included qualitative documents, both public and private documents on Longwood. Unstructured observations and interviews were conducted at an on-site visit to Longwood. An observation protocol was used to record site information. The researcher took field notes on-site in a semi-structured way to observe the information needed to complete the visual representation. Access to Longwood was given through the Pilgrimage Garden Club with Mimi Miller’s assistance. Original floor plans were used to create the base model for the virtual representation. The plans used were Sloan’s original floor plan, as well as plans recreated by Carolyn Harper, both posted in Longwood and in several books. A tour was given by several guides and the research created a photographic documentation of the structure. The site visit to Longwood captured on-site changes from original plans which would typically be tracked during construction and then transferred to finalized as-built drawings after completion. Specific field measurements and changes to the original floor plan were noted. Portable Document Format (PDF) documents were made via iPad of current inventory books stored in the gift shop. An additional private tour of the top floors was given by James Wade, the curator of Longwood. Upper stories were explored as safety allowed. Photographic documentation was made with a digital camera, and a GoPro video was taken of upper floors.

The researcher used tangible and digital sources, which included archives of photographs, sketches, and renderings. George Henkel’s original invoices to the Nutt family, which are
archived in Duke University’s David M. Rubenstein Rare Book and Manuscript Library in Durham, NC, were reviewed through PDF scans emailed to the researcher by the Reproduction Services staff at the library. The transcribed list of furniture from the invoices was located in the secondary source, *The Building of Longwood* (McAdams, 1972). A version of the floor plans, which lists the pieces of furniture to be located in each room, was created by the researcher to provide further clarity regarding the original plans for Longwood’s furnishings.

A trip to the Mississippi Department of Archives and History in Jackson, MS included examining files stored in the William F. Winter Archives and History Building. Subjects pulled were Longwood, Samuel Sloan, and the Nutt Family. Most items could be viewed in the Public Reading Room. These items were scanned using an iPad and converted into a PDF. One file had to be viewed in the Archival Reading Room due to its rare and fragile state. Staff made a copy of this item. One microfilm file was viewed in the Media Reading Room for census records. Images were captured via cellphone camera.

**Methods of Data Analysis**

The data from all sources included more information than needed for the study; therefore, the researcher winnowed the information. Winnowing is a method of only notating the data that is needed for the study and disregarding the other parts (Creswell & Creswell, 2018; Guest, MacQueen, & Namey, 2012). The researcher analyzed the data using qualitative research procedures which included organizing and preparing the data for analysis, transcribing documents, scanning materials, typing up field notes, sorting and arranging the field notes, cataloging the visual materials, and sorting and arranging data by sources. The researcher reviewed all the information and created notes of ideas. The data was gathered, organized, and
labeled. The descriptions were detailed information about the people, places, and events. The themes provided the organization for how findings were to be presented for this study. These themes were interconnected to create the story of Longwood’s never realized interiors including room locations, furniture specifications, architectural details, rotunda finishes, and virtual representation. A comparison was made to determine the accuracy of transcribed data to be used in the virtual representation.

Once the data was analyzed, the virtual representation was created. A scanned floor plan from *The Legend of Longwood* (1972) by Margaret Shields Hendrix was imported into Revit to build walls, place doors and windows, place stairs and some trim. Once the main features were defined in Revit, the model was then imported into SketchUp for detail work. Several methods were used to bring elements of details into the model in SketchUp. The rotunda floor pattern was scanned from original floor plan and imported into InDesign. The pattern was then traced, imported into TinkerCAD to become editable geometry, and then imported into SketchUp. The central fountain and detail trim were scanned from *The Heritage of Longwood* (1975) by William Whitwell. This image originated from a vertical section of the “An Oriental Villa” plan found in Sloan’s book, *The Model Architect*. According to Whitwell (1975), this gives us an idea of what would have been planned for the interior of the rotunda. The vertical section was imported into AutoCAD, outlined, and then imported into SketchUp. In order to make it editable geometry, the extension “s4u Make Face” by Suforyou was downloaded. This extension then allowed the line drawing to be manipulated using a combination of tools such as, push and pull, line, shape, and follow me. To create the curved detail work in the dome, the extension “Shape Bender” by Chris Fullmer Tools was used, in addition to the “s4u Make Face” extension. A similar process was used for the furniture. An image of the furniture was scanned from the Appendix of Sloan’s
Homestead Architecture (1867), imported into AutoCAD, outlined, and then imported into SketchUp. The “s4u Make Face” extension was used to create editable geometry, and then manipulated using various SketchUp features.

**Ethical Considerations**

Ethical considerations included identifying and gaining permissions and approvals from Longwood. The purpose of this study and how the data was to be used was clearly presented to all participants in the research. Upon data collection, all archived documents and sites were respected and disturbed as little as possible.

**Trustworthiness**

The researcher employed certain procedures to check the accuracy of the findings for qualitative validity. This included confirming consistency across other research and projects for reliability. Procedures were followed to ensure the accuracy, trustworthiness, authenticity, and credibility of the research. Multiple strategies were incorporated into the research to ensure the accuracy of the research findings. Strategies included triangulation of both primary and secondary data sources to examine the evidence needed. Themes were established on the triangulation of different sources and in return, added to the trustworthiness of the study. By using rich, thick, detailed descriptions to convey the findings, it assists in identifying with the setting and allows for a shared, realistic experience. The researcher addressed any bias, and clarified any interpretations shaped by their background by backing data up through sources on historic homes. By addressing biases, an open narrative was created, and trustworthiness increased. Transcribed letters were also reviewed for accuracy.
Summary

This qualitative study gathered research data on Longwood’s original specifications and translated them into a virtual representation. The six-step historical narrative inquiry model was used to collect and analyze data for this study. Data included both primary and secondary sources from public and private collections. Information was winnowed to what was needed for this study while additional data was retained for future research. Multiple strategies were used to ensure trustworthiness. The researcher used the research information gathered and translated the data into a virtual representation of what Longwood’s rotunda would have looked like had it been completed. The next chapter discusses the results of this study.
CHAPTER IV

RESULTS

Introduction

In this chapter, the results of the study are discussed. Results include floor plans used for the virtual representation, room locations, Longwood’s furniture selections, and the rotunda’s architectural detailing and finishes. The final product is the virtual representation which can be viewed from a mobile phone or computer. Gaps in information from the primary and secondary sources are notated along with the researcher’s resolutions.

Floor Plan

The floor plans used in this study were the original plans drawn by Samuel Sloan. These plans are found in *The Legend of Longwood* (Hendrix, 1972) as well as displayed on the basement floor walls of Longwood. Discrepancies between the original floor plan and what was built included additional doors, widened doorways, and relocated doors (see Figure 7). Since there are marked changes between the actual site and original floor plan, it is safe to assume the high probability of more changes to the floor plan had construction continued. The virtual representation was ultimately based on modified plans that consider Sloan’s original drawings and on-site observations.
Figure 7  Field observation notes with noted floor plan changes
**Room Locations**

Room layouts were also based on original floor plans by Samuel Sloan. Figure 8 illustrates the original intended room locations on each floor. These plans were drawn by Carolyn Harper in 1972, based on Sloan’s original plans which are currently posted on the basement floor’s rotunda wall. Previously, Sloan’s original floor plans had been found in one of the rooms upstairs in Longwood with some foxing and water damage (Whitwell, 1975). The plans are barely legible due to being displayed in a darker section of the rotunda to avoid further damage from light (see Figure 9). Plans for the basement, principal floor, and second floor were also located in *Godey’s Lady’s Book and Magazine, Vol. LXII* (1861). These plans indicated specific room names for each story, along with a rendered image of Longwood’s planned exterior (see Figure 10). The bedchambers located on both the second floor and attic were not labeled per the occupant. The next section on Furniture Specifications elucidates the bedchamber’s occupants based on the furniture invoices.
Figure 8  Longwood plans drawn by Carolyn Harper, created from Sloan’s original plans (Hendrix, 1972)
Figure 9 Sloan’s original floor plans (photo by author)
Figure 10 Floor plans and exterior rendering for Longwood (Godey’s Lady’s Book and Magazine, 1861)
Furniture Specifications

Research indicates that Longwood’s furniture was being specified by George Henkel’s cabinet warerooms. There are two known correspondences which indicate George Henkel’s involvement with Longwood’s furniture. The first letter was written from Henkel to Nutt on July 25, 1861 (see Figure 11). Henkel indicates that he has worked on the doors and millwork for Longwood and is sending articles of furniture which would be required for Nutt’s home. The last known mention of furniture for Longwood was found in a letter from Samuel Sloan to Haller Nutt on October 1, 1863. Sloan states that Mr. Henkel still hopes that he may have the pleasure of furnishing their new house (McAdams, 1972; Whitwell, 1975) (see Figure 12).

Figure 11 Letter from Henkel to Nutt on the furniture for Longwood (McAdams, 1972)
Dear Sir:

Your most welcome letter reached me some weeks after its date and it is now well nigh two years since we have communicated. Have thought of yourself and family thousands of times and have also felt anxious to learn the condition of your new building and pleased to learn the state you have been able to put it in as it will not injure for time to come.

The drawings you refer to I will enable to forward them the very earliest opportunity. I may perhaps during the fall or early winter make a visit to Natchez if things remain favorable enough to risk such a journey.

Smith and Walter reached home after very considerable difficulty but finally reached home safely. Smith has written several letters to you thinking that one might reach you. I have not attempted, thinking that as soon as the way was open you would write as the check to communication was near you and far distant from me that I concluded that to be the best course therefore should this reach you understand it to be the first written since the mails between us have been closed.

I have been in my usual health since we last met as well as all my family. My business has been unusually brisk for the past year.

The first year of the War it was at a complete standstill. Still I did not make office rent. There appears to be prospects of the continuation of a very heavy business in my line; in fact, more than we can get workmen to execute. In fact, all business is in a very flourishing condition and seems to be upon substantial basis.

We see no signs of War and in fact were it not for newspapers should not know such was the case.

I have seen nothing of the Army, except some recruiting occasionally in our city. Where the large armies are made up puzzles me to know as I really see but little of any change in the population here. Yet I know of some that have gone and many have again returned. With yourself I must say that I long to see this cruel war ended. We must hope for the best.

Mrs. Sloan sends her kind regards to yourself and Mrs. Nutt and yet has hopes of seeing each of you again in Philadelphia.

Mr. Henkel sends his respects and hopes yet that he may have the pleasure of furnishing the new house. He is now in Chestnut Street and occupies the store that Levy had when you were here. He makes a grand display. I suppose the finest in the whole country—or ANY COUNTRY. He is doing an immense business. Chestnut Street has wonderfully improved since your visit.

The lot then vacant opposite the Continental has now upon it three magnificent white marble stores. The largest and finest in the country. One is occupied by Arne, the Carpet dealer—the other by Successor to Levy, and the other by Howell’s, the Wall Paper Manufacturers.

I am respectfully yours,
Samuel Sloan.

Phil. Oct. 1, 1863.

Figure 12 Correspondences indicating George Henkel’s involvement in Longwood’s furniture (McAdams, 1972)
Furniture invoices, noted in original language as furniture settlements, indicate room names with furniture purchased for each room. These are cited in *The Heritage of Longwood* (1975) and in *The Building of Longwood* (1972). The originals are housed in the David M. Rubenstein Rare Books and Manuscript Library at Duke University. In Sloan’s book, *Homestead Architecture* (1867), the Appendix contains suggested furniture selections from George J. Henkle’s furniture establishment. This is the same book in which Sloan’s plans for ‘Oriental Villa’ are published. Sloan indicates the importance of furniture and material selection to harmonize with the exterior architecture. The Historic Natchez Foundation prepared a furnishing plan for exhibit panels in Longwood (M. Miller, personal communication, July 11, 2018). The furnishing plan includes sections of letters between both Henkel to Nutt and Sloan to Nutt referencing furniture selections and the settlements for Longwood. The furnishings plan also indicates the working relationship between Samuel Sloan and George Henkel, including the collaboration on the Asa Packer Mansion built in 1861 in Jim Thorpe, Pennsylvania.

By using the previously discussed room locations and invoices, the intended location for most of the specified furniture was able to be determined. The parlor and library had established invoices, but their location was not indicated on the floor plans. There are several rooms on both the basement (see Figure 13) and principal floor (see Figure 14) that were not included in the invoices. Except for the bedchambers on the second floor (see Figure 15) and attic (see Figure 16), most of the rooms with no specified furniture are private rooms, intended for family only. There are two invoices that do not correspond with rooms on the floor plan, the Parlor and Library. As stated in the Room Locations section above, the bedchambers were not labeled per occupant on the floor plans but were designated based on furniture specified. Furniture for the bedchambers on the second floor is labeled on Figure 15. Miss Nutt’s Rooms are labeled to the
right of the rotunda entrance. These rooms would have been designated for Haller and Julie Nutt’s daughters. Wardrobes were specified for these rooms; therefore, the researcher placed Mr. Nutt’s and Mrs. Nutt’s furniture on the left side of the rotunda with the attached dressing rooms. The nursery furniture was placed in the middle of Mr. and Mrs. Nutt’s bedchambers. Three additional bedchambers are noted on the attic floor. These bedchambers would have been designated for Mr. and Mrs. Nutt’s sons. Identical furniture was specified for each of the attic bedchambers.
Figure 13 Longwood’s basement plan drawn in AutoCAD by researcher to include Henkel’s invoiced furniture
Figure 14 Longwood’s principal floor drawn in AutoCAD by researcher to include Henkel’s invoiced furniture
Figure 15  Longwood’s second floor drawn in AutoCAD by researcher to include Henkel’s invoiced furniture
Figure 16 Longwood’s attic plan drawn in AutoCAD by researcher to include Henkel’s invoiced furniture
The scope of this study only includes the rotunda. However, a glimpse of the dining room can be seen through the open doors connecting the two spaces (see Figure 17). There is no furniture in the rotunda. The only furniture seen in the representation is that in the dining room. For the dining room, George Henkel specified two sideboards, one dining room table with 20 plates, 18 side chairs, two large arm chairs, and two service tables. Not priced on the invoice for the dining room were cornices, a mirror, and carpet.

Figure 17  Glimpse of the dining room from the rotunda
George Henkel’s catalogue contained several lines of dining room furniture, but his invoices to Nutt did not name a specific collection. The line depicted in the virtual representation is the Rosewood Dining Room Furniture. Images of this dining room suite (see Figure 18) are featured in Sloan’s *Homestead Architecture* (1867), the same book in which Nutt saw Sloan’s octagon-shaped home which inspired Longwood. Furthermore, the Rosewood Dining Room Furniture featured in Henkel’s Catalogue of Furniture (n.d.) includes a sixteen-foot-long by 4 feet 6-inch dining table (see Figure 19). The description of the dining table in *Homestead Architecture* (1867) also includes a dining table of the same dimensions. Lastly, the nearby reception room was specified as Rosewood. The amalgamation of Henkel’s invoices and documented images of Henkel’s furniture in publications and archives, provide a strong indication of Longwood’s potential furnishings. Figure 20 shows the images from *Homestead Architecture* (1867) placed in AutoCAD to get line details of the pieces. They were then placed in SketchUp to develop them into editable geometry (see Figure 21), and the virtual furniture was then placed in the final model.
This Plate is a faithful delineation of the articles intended to be represented.

The Sideboard is very elaborate in the carving, and has a French plate mirror in the back of the top part, and a very thick marble slab; it is an appropriate style for oiling in walnut, as the oil brings the fine carving out better than varnish does; it is five feet four inches long outside.

The Dining table is sixteen feet long, and four feet six inches wide, and is a splendid article—in fact one of the richest tables we have ever seen; the mouldings are all more massive than the cut represents; there is also a neat case for the leaves, which is on castors, for convenience in moving. Sometimes a Lunette is made with an arrangement in the seat for holding the table leaves; but this is a mere matter of convenience to the purchaser, and its utility depends on the size of the dining room.

The Arm-chair and the small chair are in perfect union of style with the other articles; they have spring seats, and are most generally covered with French morocco and studded with gilt nails; reeds for the covering and window-curtains is a very pretty finish, but it is too warm for a Southern climate, and is likely to be attacked by moths; the morocco generally used is only split horse-skin; the French morocco or goat-skin is easily distinguished, as after dressing there is a dark streak left, caused by the goat’s mane.

Figure 18 Dining room furniture page from the appendix of Sloan’s *Homestead Architecture* featuring George Henkel’s furniture (Sloan, 1867)
ROSEWOOD DINING ROOM FURNITURE.

Extension Tables, Rich Pattern, the loose leaves all
Rosewood, the table 16 feet long, and
4 feet 6 inches wide, (Brigg’s Patent,) $150.00

Same Table, 12 feet long, 4 feet wide,
Do on legs, 12 by 4 feet,
Do do 16 by 4 feet 6 inches,
Arm Dining Chairs, leather cushions,
Do do plain style,
Do do cane seat imitation,
Etagere Buffets, Mirror backs and doors, White Marble, very elegant,
Do do Sienna Marble,
Do Plain with White Marble,
Wine Coolers, (Cellerets,) 20 to 75
Lounge to hold Table Leaves, 40 to 60

The above Extension Dining Table has taken the Premiums at the National Fair at Washington, at the Boston Fair, and at the Franklin Institute, in Philadelphia, and it is acknowledged to be the best in use. The extension being formed by cross-arms working at right angles on metal hinges, preserves it from the objections to all other Tables, viz:—swelling and shrinking with the weather in our variable climate. The difference in price of Tables does not interfere with the construction, as the same extension is used in the lowest price as in the most expensive, the difference being only in the ornamental part.

Figure 19  Rosewood dining room furniture page from Henkel’s catalogue of furniture (Henkel, n.d.)
Figure 20 Henkel’s rosewood dining images in AutoCAD, used for furniture details
Figure 21 Rendering of Henkel’s rosewood dining room suite in SketchUp, the top image is the dining room table and the bottom image is a side chair.
The punkah, a large dining room fan powered by a pulling cord, used in the virtual representation was rendered based on the current one hanging in Longwood’s basement dining room. In Antebellum Mississippi, punkahs were part of typical dining room décor. They were operated by servants and not only provided a flow of cool air, but also shooed flies away from the table (Gildart, 2009). Punkahs were not able to be purchased in a store or ordered but were custom-made locally and unique to every home (M. Miller, personal communication, July 11, 2018). Creating the representation of the punkah for the model followed the same process as the above furniture. A photo of the punkah currently located in Longwood’s basement was imported into AutoCAD then made into editable geometry in SketchUp (see Figure 22).
Figure 22  Top image is the punkah already located in Longwood (photo by author). The bottom image demonstrates the process of developing Longwood’s punkah into virtual model from AutoCAD to SketchUp
Architectural Detailing

Architectural detailing in the virtual rendering was derived from a combination of sources. The floor pattern for the rotunda was obtained from the floor plan recreated by Carolyn Harper (see Figure 23). Harper’s pattern is based on the faint pattern seen in Sloan’s original plans (see Figure 24). A similar floor pattern was also found on the first story rotunda floor in Sloan’s *The Model Architect* (1853) (see Figure 25). For rendering purposes, Carolyn Harper’s plan had the clearest lines for recreating the pattern. Figure 26 illustrates the pattern derived from Harper’s plan and then used in the model. The illustration notates the glass placed in the floor to let light into the basement, which can be viewed in the virtual representation. Figure 27 shows a current image of the panes into the basement on the principal floor.

Figure 23  Carolyn Harper’s recreated floor plan displaying the floor pattern (Hendrix, 1972)
Figure 24  Sloan’s original floor plan with the rotunda’s faint flooring pattern (photo by author)

Figure 25  First story plan in *The Model Architect* (Sloan, 1853)
Figure 26  The pattern derived from Harper’s plan and then used in the model

Figure 27  Current image of the floor panes on the rotunda’s floor
The architectural trim and moldings depicted in the virtual representation are taken from segments of the vertical section in Sloan’s *The Model Architect* (1853) (see Figure 28). There is no known vertical section of Longwood, therefore the Oriental Villa’s section is the best-known indicator as to what Sloan might have planned for Longwood. There are some notable differences between the Oriental Villa vertical section and Longwood. First, Longwood has an additional floor, planned as a private sleeping quarter. Second, many of the doorway arches in the Oriental Villa are different than Longwood’s. For the purposes of the virtual representation of Longwood, the Oriental Villa’s section was adapted to match the conditions at Longwood. Figures 29 and 30 below illustrate how some of the details from the section were translated into the 3D model.
Figure 28  Vertical section of “An Oriental Villa” in The Model Architect (Sloan, 1853)
Figure 29  The top two images depict the central fountain and the bottom two images depict a statue located in the niche
Figure 30  Trim from the vertical section used for the virtual representation
Currently, the original doors and windows are no longer located at Longwood. An image of the original windows can be found on a lithograph by Sloan depicting Longwood’s exterior (M. Miller, personal communication, April 5, 2019; Sloan, 1867) (see Figure 31). The virtual replications were built in Revit using this image. The principal story windows’ unique muntins were placed accordingly and portions can be seen in the dining room of the virtual representation. According to the specifications, the jamb casings on the principle floor were to be two inches wide with semi-circular heads (McAdams, 1972; Whitwell, 1975).

Figure 31 Virtual replication of the original window located on the principle floor
Longwood’s specifications state that each room’s ceiling on the principal floor was to have an ornamental pattern and was to be frescoed to coordinate with the general style, selected by the owners (McAdams, 1972; Whitwell, 1975). There are no known existing ceiling plans for Longwood. The ceiling shown in the dining room of the virtual representation was based on two factors, an image from an addition on a local Natchez home of the same period, Wigwam Mansion (see Figure 32), and a design for a ceiling by Samuel Sloan. The ceiling inspiration from the Wigwam Mansion was provided by Mimi Miller. According to Mimi, this image of the painted wall treatment is a good representation of what would have most likely been in Longwood’s dining room (M. Miller, personal communication, April 5, 2019). Ron and Mimi Miller have identified the artist of Wigwam’s fresco work to be D.W. Ducie (Black, 1998). Prior to the Civil War, D.W. Ducie was a local fresco artist that also specialized in graining, glazing, varnishing, gilding, and paneling. Miller indicated that Ducie could have been the artist hired for Longwood’s ceiling and wall treatments, had construction continued. The second factor used to determine the dining room ceiling treatment was a detail from *The Model Architect* (1853) drawn by Samuel Sloan (see Figure 33). The dining room ceiling would have been similar to either of the figures below. For the virtual representation, the image of Sloan’s ceiling detail was used to depict the vision he might have had for the dining room ceiling (see Figure 34).
Figure 32  The ceiling in the Wigwam House used as a reference for the dining room ceiling (Oliver, 1953)

Figure 33  A design for a ceiling from *The Model Architect* (Sloan, 1853)
Rotunda and Dining Room Finishes

Some finishes for Longwood’s interiors were notated in McAdam’s book, *The Building of Longwood* (1972) and *The Heritage of Longwood* (1975). References to finishes and specifications can be found throughout the letters between Sloan and Nutt. The transcribed versions can also be found in *The Building of Longwood* (1972). Not all finishes could be found in the primary and secondary sources for Longwood’s rotunda. Several reference books were used to gather finishes for the time period to complete the virtual representation.

The floor of the rotunda on the principal floor was said to be laid with encaustic tile in an ornamental pattern with floor lights arranged to light the floor below (McAdams, 1972; Whitwell, 1975). Marble was specified for the basement rotunda, first story hall, and veranda floor. The floor plan drawings by Sloan display the flooring opposingly, with the encaustic tile on the basement rotunda, first story hall, and veranda floor. Sloan depicts marble on the principal
floor of the rotunda. Images of encaustic tile patterns in Sloan’s book *Homestead Architecture* (1867) also corroborate the discrepancy (see Figure 35). The floor plan drawn by Sloan was used as the deciding factor in depicting marble for the principal floor rotunda’s flooring material in the virtual representation. All other floors were to be laid with 5/4” heart-pine, mill-worked, well-seasoned, and smoothed off. Carpet is said to have been Brussels carpet from John Burrows (M. Miller, personal communication, July 11, 2018). The carpet depicted in the dining room would have been specified by the owners according to their preference. For the virtual representation, carpet was selected from the J.R. Burrows & Co. Carpets from their historic Brussels, ‘High Victorian Period’ collection from 1850-1875 (see Figure 36).

All doors throughout the home were to be white pine, except the principal floor doors which were specified to be walnut with three coats of varnish. It was common practice during this time period to use less expensive wood for upper floor doors and then paint them as a faux wood to resemble a wood grain of a more expensive species (Spellen, 2010), such as that found on the principal floor. For this reason, the virtual representation displays the doors on the second floor and attic with the same walnut finish as the principal floor. The second floor doors were specified to have winter hinged doors and louvered sliding doors for the summer (M. Miller, personal communication, July 11, 2018; J. Wade, personal communication, July, 15, 2018).
Figure 35  Encaustic flooring tile patterns from Sloan’s *Homestead Architecture* (1867)
All walls and ceilings throughout Longwood were to be plastered with two coats of brown mortar and finished with one white hard finish. The walls and ceilings were to be finished per the owner’s specifications to correspond with the general style of the interior. Final colors and patterns for the walls and ceilings were not specified in any of the primary or secondary sources and would typically have been chosen by the owner after construction.

Sloan exhibits strong sentiments towards harmonizing paint colors with furniture. In both *The Model Architect* (1853) and *Homestead Architecture* (1867) he discusses these thoughts. His views on color coordination are adapted from the book, *Laws of Harmonizing Color* (Hay, 1836; Sloan, 1867). Sloan expresses his distaste for bright, intense, or strong colors being used for walls and ceilings, stating that they should be avoided (Sloan, 1853; Sloan, 1867). He expresses that soft, neutral tints should be used. He also states that the use of colors of natural objects is a safe rule when picking colors. Although Sloan writes about the coordination of colors, he does
not suggest a color palette, and writes in Homestead Architecture (1867) that interior painting is beyond his scope of work. Sloan does, however, include several color images in his books, indicating approved color palettes. Paint colors for the rotunda in the virtual rendering were derived from Sloan’s ceiling detail in The Model Architect (1853) cited above. The red, green, and blue (RGB) color value was extracted from the ceiling detail by importing the image into InDesign, extracting the color with the eyedropper tool, and then transcribing it into the SketchUp model for accuracy (see Figure 37). Paint colors were typically deep, rich, and pronounced during the Victorian Era and included deep yellow-greens. The carpet in the dining room also indicates popular colors used during this time. For these reasons, the dining room paint was depicted as Dark Olive, which according to Birren (1963) was a popular color. This color was pulled from ‘The Victorian Era’ color palette in Color for Interiors: Historical and Modern (1963). The RGB color value was extracted from the color palette using a Color Muse device and mobile phone application. It was then copied into the virtual rendering.

Figure 37  The color palette extracted from the ceiling detail in The Model Architect (1853)
Specifications for the window treatments were not found in any primary or secondary sources. Like the paint colors, these would have been chosen by the owner after construction was complete. Supplementary information from *Victorian Interior Decoration: American Interiors 1830-1900* (1986) was used to complete the window treatments in the dining room. A crimson damask was used for the fabric on the window treatments (see Figure 38). Fabrics available during this time period were cotton, linen, wool, and silk (Winkler & Moss, 1986). *Godey’s Lady’s Book* (1861) states damask was used to create one of the richest effects, with a lighter style cornice and lace under-curtain. Winkler & Moss (1986) describe damask as one the chosen fabrics for a dining room during this period. The treatments would have been placed at the ceiling to avoid covering the window and extend beyond the moldings to appear broader and admit more light (Winkler & Moss, 1986). The fabric length would have touched the floor and would have been able to be hand drawn to access opening the floor length window. Pivot shutters would have been used on the principal floor’s exterior that slid into the walls (McAdams, 1972; Whitwell, 1975).
Virtual Representation

The final virtual representation for this study is formatted as a 360 degree stereo panorama view. The viewer remains stationary and is able to look up, down, and around using a standard mobile phone or tablet. The virtual representation can be pulled up by either a cloud link (https://api2.enscape3d.com/v3/view/0a7ce864-4b14-41be-8923-fb9a10bdea06) or Quick Response (QR) code (see Figure 39). Once the stereo panorama view is open, it can be viewed by rotating the viewing device around in either a standard view or using portable VR goggles for a mobile phone. It can also be viewed on either an iPhone Operating System (iOS) or Android device.
The viewer begins the virtual experience by standing close to the center of the rotunda, facing the dining room (see Figure 40). To the left of the viewer is the central fountain, which was rendered, based on the vertical section (see Figure 41). The rotunda is octagonal, with four doorways and four niches. The architectural detailing taken from the vertical section can be seen throughout the rotunda as the viewer moves the viewing device. As the viewer looks at the rotunda floor, the pattern from Carolyn Harper’s redrawn plans can be seen. The viewer can also see the eight round windows in the floor used to let light into the basement level (see Figure 42). Straight ahead is the dining room, where George Henkel’s dining table and chairs are located, along with the punkah (see Figure 43). When the viewer looks up toward the dome, the central gallery on each floor can be seen along with the architectural detailing peeking over the railing. While looking up, the viewer sees the central dome (see Figure 44).

Figure 39  QR Code to view virtual rendering via mobile phone
Figure 40 Initial view of virtual representation
Figure 41  Central rotunda fountain

Figure 42  Rendered floor pattern and eight round windows in the floor used to let light into the basement level
Figure 43  Virtual dining room view of Henkel’s furniture and existing punkah

Figure 44  View of dome in virtual representation
Summary

The information in this chapter covered the key results in this study. Results included floor plans used for the virtual representation and discrepancies that were found during field observations, identifying room locations based on several known plans for Longwood, Longwood’s furniture selections by George Henkel, the rotunda’s architectural detailing and finishes, and the virtual representation development. Missing gaps in data were identified and resolved using credible, period book sources and research from other period homes. The ultimate outcome of this study is a virtual representation of Longwood’s intended rotunda design that can be viewed from various devices. The next chapter discusses the conclusions and implications of this study and recommendations for future research.
CHAPTER V
CONCLUSION

Introduction

In this section, key aspects of the study are identified, conclusions of the study are indicated, and discrepancies in information are noted and discussed. Implications of the study and the researcher’s recommendation for future research are also indicated in this chapter.

Conclusions of the Study

This study sought to determine the extent to which an accurate virtual representation of Longwood’s rotunda could be created using primary and secondary sources of Longwood’s lost interiors. Many of the primary source documents mentioned in the secondary source books were readily available. Additional information on finishes was needed to complete Longwood’s rotunda and obtained through supplementary research. The finishes were informed by period information to include paint for the walls and trim in the rotunda and dining room, and carpet and window treatments in the dining room.

Therefore, the researcher can conclude that the rotunda could not be completed solely on primary and secondary sources pertaining specifically to Longwood. There was missing key information that would have been chosen by the homeowners later in construction. Consequently, the gaps in information needed to complete the virtual representation are filled by using evidence from the time period. Several significant elements including carpet, furnishings,
and paint had to be pieced together using personal communications from Mimi Miller of the Historic Natchez Foundation, James Wade, the curator of Longwood, and books containing information regarding interior finishes of the time period.

Fairly accurate floor plans were available. However, they did not account for any on-site changes that could have occurred as construction continued. The extent and nature of these changes will never be known. There was no known detailed plan for the interior of Longwood. The vertical section of the Oriental Villa, used as a reference to piece together the rotunda’s detailing, was the closest depiction of Longwood’s intended interiors. One main change from The Oriental Villa to Longwood was the doorway arches. The shape of the arches depicted on the basement floor in the Oriental Villa’s section, were the same found throughout Longwood’s principal floor. This variation in arch shape required the trim to be adapted in the virtual representation. Since the section was not drawn specifically for Longwood, it will never be known what the true intentions were for the interior.

There was also a discrepancy with the flooring material in the rotunda. The specifications noted in both The Building of Longwood (1972) and The Heritage of Longwood (1975) stated there to be encaustic tile on the floor in the rotunda on the principal floor and marble floor in the basement rotunda. The encaustic tile patterns found in Homestead Architecture (1867) match that of the basement, hall, and veranda’s flooring which was stated to be marble. When viewing the original floor plans, it appears these have been switched to include marble on the principal level’s rotunda floor and encaustic on the other floors.

Most of the room names are indicated on the original floor plans, but research into other period homes was needed to determine unmarked rooms. Given the original settlements, correspondences, and relationship between Sloan and Henkel, it is safe to assume that George
Henkel’s furniture would have been purchased for Longwood. There are still many rooms that were not noted on the furniture invoices. These rooms could have been filled with furniture the Nutts had already acquired or furniture for these rooms could have been left to select later. Intended finishes were best documented through the letters between Sloan and Nutt. Not all finishes were listed, leaving the need to fill in the gaps with additional research. Carpet and window treatments had yet to be selected by the Nutts; therefore, additional research was needed.

**Implications of the Study**

The main goal of this study was to create a virtual reality representation that could be used at Longwood. As the model stands, it can be viewed on-site with any mobile device through a link or QR code. Visitors can either type in the link or scan the QR code to gain access to the virtual representation of Longwood’s rotunda. The researcher will work with Longwood’s tour guides to make sure they are versed on the process of gaining access to the model and able to share the experience with Longwood’s guests. Signage including directions on how to view the model could be located in the rotunda. Signage would include a QR code to scan, website link, image of the initial view in the model, and a map with the viewer’s location for reference (see Figure 44).
Figure 45 Example of signage for Longwood to view virtual representation

Or Visit: https://api2.enscape3d.com/v3/view/Da7ce884-4b14-41be-6923-fb9a10bdea06
Secondly, this study sought to provide a learning tool for practitioners, scholars, and students. Practitioners can use this research as inspiration for selecting finishes, furnishings, and architectural detailing of the given time period. Students can use this research as a learning tool in their educational understanding of the interior planning, architectural detailing, finishes, and furnishings of the Antebellum South. Scholars can build on the foundation of this type of research, completing similar studies of other historical homes. Architectural dilettantes visiting Longwood can also use the virtual representation as a tool to fully immerse themselves in an interactive learning experience and experience the unique architectural features Longwood would have had.

**Recommendations**

For future research, the remainder of the house and exterior could be completed. Additional research should be conducted to identify the unnamed room on the basement floor and confirm proper room placement of the parlor and library furniture mentioned in George Henkel’s invoices. Further research could also include furnishings for the rooms without specific invoices. To further develop the full home, wallcoverings, carpets, window treatments, and accessories of this time would need to be investigated in greater detail.

The development of a mobile phone application that builds upon the virtual representation of the home could provide a richer experience for viewers. Site testing of a full virtual rendering would need to be completed. A full model could be developed through Unity, including interactive areas for the user to learn more information on any aspect of the model. For instance, if a user wanted to learn more about a particular piece of furniture, they would click on
that piece and more information would appear. This model could then be translated into an application for iOS and/or Android.

This study was limited to digitally completing Longwood’s rotunda. Future research could also include taking this research model and using it to virtually restore, preserve, or complete additional architecture. Not only can this study be used to visually create something that was never completed, such as Longwood, but it can also be used to restore historic structures that have become dilapidated or record a structure before it is torn down. This can be a time-consuming process and might be limited by available resources. The process could be expedited with equipment such as 3D laser scanners to capture the existing architectural conditions.

Previous work started by Google has teamed with a 3D laser-scanning non-profit to digitally preserve historic sites that are at risk of irrevocable damage, demolition, or dilapidation (Statt, 2018). This study could expand on their digital preservation model to include the interiors of those structures. By virtually restoring, preserving, or even rebuilding, structures can come back to life. This would create a new tool to study the built environment through a computer or mobile device and help preserve and protect historic architecture virtually.

The ability to explore a historic site virtually would open opportunities for those that may not be able to visit the site. For those that are able to visit, future research could also consist of analyzing the impact of this type of tool on a visitor’s experience at historic sites. Auspiciously, virtual reality is a tourism learning tool, capable of evoking historical empathy, and has the potential to be used to allow people to experience an historic site without disturbing its preserved state.
Summary

The purpose of this study was to gather data on Longwood’s original specifications and translate that data into a virtual representation of what Longwood’s rotunda would have looked like had it been completed. Data was pulled from primary and secondary sources, while gaps in information were identified and filled in with supplementary research of other period homes and personal communications with local Natchez historians. Future research includes expanding the model to include the whole home’s interior and exterior as well as developing an interactive application. This study is important and adds to the body of knowledge by becoming a model that other researchers can use and expand with other homes or buildings, to visually explore and edify. It demonstrates that a virtual representation can be successfully created using the historical narrative inquiry method, but supplemental research may be needed to complete the model, depending on the information found in the primary and secondary sources. The virtual representation of Longwood’s rotunda provides a slight sense of completeness to what has stood as a symbol of Haller Nutt’s physical and financial defeat:

Longwood: It stands there on a hill of the Mississippi, a partly builted masterpiece, unfinished, but complete with time – flanked by woods garlanded with moss, with its many rooms, its numerous porticos, its central hall and rising dome, at the end of a sunken roadway. And long after cotton was King, long after slavery vanished, I was deeply stirred by that wistful house in old Natchez. Standing within its walls I envisaged the slaves making brick, the foreign workmen laboring. The marbles arriving from Italy, and the architect reveling in his vision. With fate brooding overall – I imagined the master and the mistress there, briefly dreamed their dream and witnessed their hope turned to ashes – strange unfinished walls, unpainted timbers, and soaring dome which play upon the emotions as a master’s hands upon the keyboard. It is because Longwood holds the root and the bloom, the height and the depth, the joy and sorrow, hope and despair, the life and the death of a culture. Author Unknown. (Hendrix, 1972, p. 3)
REFERENCES


APPENDIX A

FIELD OBSERVATION IMAGES OF LONGWOOD’S INTERIOR (PHOTOS BY AUTHOR)
View of the rotunda’s dome from the principal floor.

View of the rotunda on the principal floor, looking into adjacent room.
Rotunda stairs on attic floor, leading up to clerestory windows and dome.
Window frame on second story.
Bracing for door arches.

Second story room, the three windows lead to a balcony.
Another view of second story windows leading to a balcony.

Top of principal story stairs located in the hall, leading to the second story.
Bedchamber doorframe, sliding louvered door and hinged door were planned for the bedchambers leading off of the rotunda.
Upper view of the rotunda.

Smaller windows location in the attic floor bedchambers.
View of the rotunda from an attic floor bedchamber.
View of the rotunda from the attic floor gallery.
Attic floor bedchamber.
VITA

Sarah Hathcock was born in Chattanooga, TN to Jim and Debbie Hamilton. She is married to James Hathcock and they have 2 children. She graduated magna cum laude from Watkins College of Art, Design, & Film with a Bachelor of Fine Art in Interior Design and holds an Associate Degree in Environmental Science from Chattanooga State. Sarah has a Tennessee contractor’s license and has passed the National Council for Interior Design Qualification (NCIDQ). She is a member of the American Society of Interior Designers (ASID) where she is the current Professional Development Director, as well as a member of the Interior Design Educators Council (IDEC). Sarah’s past work experience in the field of Interior Design include working as the Construction Coordinator for the Greater Nashville Area Habitat for Humanity, Interior Designer for two Chattanooga furniture retail outlets, and the proprietor of an Interior Design practice. She currently works as a graduate assistant for the Department of Interior Architecture and Design. Sarah is graduating with a Master of Interior Design degree and Construction Management Post-Baccalaureate Certificate from the University of Tennessee at Chattanooga in August 2019.